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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/694,774	10/24/2000	Edson Jose Joaquim De Souza	Q61420	7442

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SUGHRUE, MION, ZINN, MACPEAK & SEAS  
2100 Pennsylvania Avenue, N.W.  
Washington, DC 20037

EXAMINER

DOROSHENK, ALEXA A

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 06/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/694,774	DE SOUZA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Alexa A. Doroshenko <i>ADD</i>	1764	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 June 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 October 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>10/24/00 &amp; 6/15/01</u>  | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

The references which have been lined out of the IDS of June 15, 2001 have already been listed on the IDS of October 24, 2000.

### ***Specification***

1. The disclosure is objected to because of the following informalities:

Page 8/18, line 15, there appears to be a typographical error. It appears that "9400" should be "(400)".

Page 14/15 is missing from the specification.

Page 17, line 20 (in claim 26) it appears that a comma is missing between the words "one" and "two".

Appropriate correction is required.

### ***Drawings***

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "wherein 2, 4, 6 or more of said systems are radially coupled to the riser of a fluid catalytic cracking equipment, at one two or more riser levels, at an elevation angle between 30 and 70°" of claim 26 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if

only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

3. Claims 1-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the discharge zones" in lines 19-20. There is insufficient antecedent basis for this limitation in the claim.

Claim 1 is unclear as to the structural definition of the nozzles "geometrically placed so as to transfer, by contact, the energy of the atomization fluid to the flow of liquid feed". This geometry is not defined in the specification and therefor it is unclear as to what placements are encompassed by this limitation. For examination purposes,

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this limitation has not been given weight in the claims since no scope can be determined.

Claim 16 recites that the angle  $\alpha$  is a function of the number of nozzles. This is unclear as such a function or relationship has not been defined in the specification. Since a relationship has not been defined, the scope of this claim cannot be determined and therefor the claim has not been examined on its merits.

4. Claim 27 provides for the use of the apparatus of claim 1, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

### ***Claim Rejections - 35 USC § 101***

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claim 27 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

### ***Claims Analysis***

7. It is noted that claims 1-26 recite the term "system". A system is not a statutory class of invention and therefore the claims are interpreted as apparatus claims.

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***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-6 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Chen et al. (5,794,857).

With respect to claim 1, Chen et al. discloses a feed assembly (100) for an FCC reactor comprising:

an inner conduit (105) and an outer conduit (115);

a fluid inlet (120) to the inner conduit (105);

a feed inlet (125) to the annular space formed between the inner (105) and outer (115) conduits;

a row of nozzles (145) for the inner conduit (105) (central nozzles);

a row of nozzles (155) for the outer conduit (115) (feed side nozzles); and  
a mixing zone (col. 1, lines 43-57) ) formed adjacent to the central nozzles (145).

Claim 2-6 continue to read on the apparatus of Chen et al. since the material worked upon does not limit apparatus claims. MPEP 2115.

With respect to claim 10, Chen et al. illustrates in figure 1 wherein the symmetry axes of the central nozzles (145) are parallel to the symmetry axes of the conduits (105 and 115).

10. Claims 1-7, 9, 11-15, 17-19 and 23-25 are rejected under 35 U.S.C. 102(e) as being anticipated by Chen (US 6,387,247 B1).

With respect to claim 1, Chen discloses a feed apparatus (100) for an FCC reactor comprising:

- an inner conduit (22) and an outer conduit (38);
- an atomization fluid inlet (12) to the inner conduit (22);
- a hydrocarbon feed inlet (8) to the annular space (9) formed between the inner (22) and outer (38) conduits;
- a row of nozzles (14) for the inner conduit (22) (central nozzles);
- a row of nozzles (11) for the outer conduit (38) (feed side nozzles); and
- a mixing zone (42) formed adjacent to the central nozzles (14).

Claim 2-6 continue to read on the apparatus of Chen since the material worked upon does not limit apparatus claims. MPEP 2115.

With respect to claim 7, Chen illustrates wherein there is at least one feed side nozzle (14) for each central nozzle (14).

With respect to claim 9, Chen discloses that the total number of central nozzles (14) (col. 6, lines 37-41) and feed side nozzles (11) (col. 6, lines 18-20) can be any reasonable number. Chen discloses a preferred range of 4-20 for central nozzles (14) and a preferred range of 1 to 12 for feed side nozzles (11).

With respect to claims 11 and 12, it can be seen in figure 1 that the axes of the nozzles (14 and 11) are non-parallel to the symmetry axes of the conduits (22 and 38).

With respect to claim 13, Chen illustrates in figure 1 wherein the mixing chamber (42) is a locus formed by the sequence contact point of the atomization fluid (12) and the feed (8).

With respect to claim 14, it can be seen in figure 1 of Chen that the ratio between the length and width of the mixing chamber (42) falls between 0.5 and 20.

With respect to claims 15, 17 and 18, it can be seen in figure 1 that an angle  $\alpha$  can be measured from the nozzles and that that angle is between zero and 20°.

With respect to claim 19, Chen discloses wherein the central nozzles (14) are cylindrical (col. 6, lines 25-31).

With respect to claim 23, Chen wherein the feed nozzles (11) are cylindrical (col. 6, lines 42-46).

With respect to claims 24 and 25, it can be seen in figure 2A wherein side feed nozzle (11) has a convergent section, an inner bevel (41), an inlet portion and an outlet orifice.

### ***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.



12. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

13. Claim 8 is rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Chen (US 6,387,247 B1).

With respect to claim 8, Chen discloses that the total number of central nozzles (14) (col. 6, lines 37-41) and feed side nozzles (11) (col. 6, lines 18-20) can be any reasonable number. Chen discloses a preferred range of 4-20 for central nozzles (14) and a preferred range of 1 to 12 for feed side nozzles (11). Thus, having at least two feed side nozzles (11) for each central nozzle (14) is held to be either a disclosed possibility of the given ranges or at least an obvious variation of one of combinations of possible number of nozzles disclosed by Chen.

14. Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen (US 6,387,247 B1) in view of Williatte et al. (5,037,616).

With respect to claims 20-22, Chen discloses wherein the shape of the central nozzles (14) can be "other forms of passages known in the art" (col. 6, lines 42-46), but is silent as to a convergent/divergent (venturi) shape.

Williatte discloses a nozzle for feed injection into an FCC reactor riser and teaches the use of a venturi (both converging and diverging forms are in a venturi) in order to achieve atomization of the feed (col. 4, lines 5-39). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a venturi shape as a form for the nozzles of Chen in order to achieve atomization as well as since Chen recognizes that many forms known to the art could be used.

15. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen (US 6,387,247 B1) in view of Steffens et al. (5,173,175).

Chen discloses wherein the number of feed nozzle assemblies (100) coupled to a FCC riser reactor can be any reasonable number (preferably 1 to 6) (col. 4, line 66- col. 5, line 7), but is silent as to having the nozzles at an angle.

Steffens et al. discloses a feed nozzle for the riser of an FCC reactor and teaches that "in a typical unit, the feed injector may discharge at an angle to the riser of between 0° and 75°" (col. 5, lines 43-49). It would have been obvious to one of ordinary skill in the art at the time the invention was made to angle the feed assemblies of Chen as it well known in the art that feed injection nozzle assemblies are angled when feeding to a FCC reaction riser.

### ***Conclusion***

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexa A. Doroshenk whose telephone number is 571-272-1446. The examiner can normally be reached on Monday - Thursday from 9:00 AM - 7:30 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Alexa Doroshenk  
Patent Examiner  
Art Unit 1764

June 11, 2004